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Short-term memory binding in Alzheimer's disease and other non-Alzheimer dementias

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Abstract

Background: Temporary memory for objects bound with colours is impaired in patients with Alzheimer's disease (AD) (Parra et al., 2009). However, temporary memory for coloured items is not affected by age (Brockmole et al., 2008; Parra et al., 2009). How specific is this STM binding impairment in AD, remains unknown. **Aims:** To investigate STM binding in AD and non-AD dementias. **Methods:** A STM binding task was devised requesting participants to remember arrays of common objects, colours, objects and colours as independent features (unbound), or objects bound with colours. Participants' free recall of the studied items was assessed immediately after a brief presentation. Patients with AD (n = 15), Fronto-Temporal Dementia (n = 14), Parkinson Dementia (n = 10) and Vascular Dementia (n = 9) matched for demographic and neuropsychological background, and an age and education matched sample of healthy older adults (n = 21) entered the study. All patients were assessed with 4 single, 4 unbound items or 2 bound items, whereas healthy elderly with 8 single, 8 unbound items or 4 bound items. **Results:** a two-way mixed ANOVA revealed significant effects of Group and an interaction between Group and Stimuli (i.e., single vs. unbound vs. bound items). The interaction was solely driven by AD patients performing worse than the other groups in the binding condition only. Performance in the binding condition was dramatically worse than in the single and unbound items conditions only in AD patients. **Conclusions:** STM binding is affected in AD patients but is spared in healthy older adults and non-AD dementias. This suggests that STM binding deficits are specific to AD.

Brockmole, J., Parra, M.A., Della Sala, S., & Logie, R. (2008). Do Binding Deficits Account for Age-Related Decline in Visual Working Memory? *Psychonomic Bulletin & Review*, 15, 543-547.

Parra, M.A., Abrahams, S., Logie, R., & Della Sala, S., (2009). Age and binding within-dimension features in visual short term memory. *Neuroscience Letters*, 449, 1-5.

Parra, M.A., Abrahams, S., Fabi, K., Logie, R., Luzzi, S., & Della Sala, S. (2009). Short term memory binding deficits in Alzheimer's Disease. *Brain*, 132, 1057-1066.